

REMARKS

Applicant wishes to thank the Examiner for the attention accorded to the instant application, and respectfully requests reconsideration of the application as amended.

Formal Matters

In this Response, claims 1, 3, 6, 7, 12, 14, 17, 18, 23, 25, 28 and 29 are amended to more clearly recite the invention, and to correspond with the European patent application (EP 1 403 810) which also claims the present invention. Claims 2, 4, 5, 8-11, 13, 15, 16, 19-22, 24, 26, 27 and 30-33 are canceled. Claim 1 is amended to include the features and limitations of claims 2 and 8. Claim 12 is amended to include the limitations of claims 13 and 19. Claim 23 is amended to include the features and limitations of claims 24 and 30. Support for the recitation of "plural frequency bands" in claims 1, 12, and 23 can be found in the specification on page 17, lines 4-6. Claims 3, 14 and 25 are amended to include "the discriminant functions being for finding a characteristic value according to the feature values, and the characteristic value being used for deciding whether the input data are proper for the authentication or not"; support for this amendment can be found in the specification on page 21, lines 6-10. Support for new claims 34, 37 and 40 can be found in the specification on page 20, lines 2-7. Support for new claims 35, 38 and 41 can be found in the specification on page 20, lines 18-26. Support for new claims 36, 39 and 42 can be found in the specification on page 18, line 13 to page 19, line 14. No impermissible new matter has been added.

Applicant thanks the Examiner for acknowledging the claim of foreign priority under 35 U.S.C. 119 (a)-(d), and for review and consideration of the references cited in the Information Disclosure Statements filed on April 3, 2006 and on July 21, 2004.

Drawings

Replacement Figure 4A is submitted herewith, to correct a minor error. Specifically, the spelling of "simplification" is corrected.

Specification

In the specification, the following paragraphs have been amended to make minor editorial corrections: the two paragraphs beginning on page 5, line 8, the paragraph beginning on page 6, line 24; the paragraph beginning on page 7, line 10; and the two paragraphs beginning on page 8, line 2.

Rejection of Claims Under 35 U.S.C. §103

Claims 1-3, 5, 6, 8, 9, 11-14, 16, 17, 19, 20, 22-25, 27, 28, 30, 31 and 33 are rejected under 35 U.S.C. § 103(a) as unpatentable over Nakajima, U.S. Patent No. 6,094,499 in view of Bjorn, U.S. Patent Application Publication No. 2001/0040987. This rejection should be withdrawn based on the comments and remarks herein.

The present invention provides a fingerprint authentication method capable of judging whether input data is proper from various viewpoints, and also capable of performing fingerprint authentication with a high degree of accuracy, at low cost and in a short time. The inventive device and method takes into account at least three factors to judge the authenticity of the fingerprint. These factors are the outside light unrelated to the light source of the fingerprinting device, whether the object on the fingerprint sensor has the characteristics suitable for a fingerprint, and whether the object is properly put onto the fingerprint sensor. Judging whether these factors are met and whether the input data is proper is done using a spatial frequency analysis of the input data. Two predetermined spatial frequency bands are used in a Fourier transformed image to calculate feature values representing features of the spatial distribution of

brightness of the input data. These procedures enable the high degree of accuracy obtained by the invention.

The Examiner contends that Nakajima discloses a fingerprint authentication method comprising a first step of collating features on input data based on a fingerprint input by a user with features of enrolled data, and further discloses a third step of authenticating the input data according to the results of the first step and the second step. Applicant disagrees.

Nakajima discloses “a pattern collation apparatus which can identify a registration pattern and a collation pattern as identical patterns or different patterns even if a rotation offset occurs between the registration pattern and the collation pattern” (column 1, lines 42-46). Nakajima further discloses comparing the correlation value with a predetermined threshold, in step 411, and if the correlation value is larger than the threshold, then it is determined that the registration fingerprint coincides with the collation fingerprint, in step 412 (column 10, lines 56-60). However, Nakajima does not disclose or suggest authenticating using the results of the first comparison (collating step). For example, Figures 4, 13, and 14 of Nakajima each disclose only one conditional or comparison step. Accordingly, Nakajima does not disclose the third step of authentication according to the results of the first and second step, as recited in independent claims 1, 12, and 23.

Further, the Examiner acknowledges that Nakajima does not disclose a second step of judging whether the input data are proper for authentication, but contends that Bjorn discloses this step. The Examiner alleges that Bjorn’s disclosure of testing whether a fingerprint is detected on the sensor platen and additional disclosure of detecting if the fingerprint matches with a database of fingerprint templates reads on judging whether input data are proper for authentication. Applicant disagrees.

Bjorn discloses a method and apparatus for fingerprint recognition wherein a fingerprint is detected on a sensor, the fingerprint is digitized and a digitized background is subtracted from the digitized fingerprint, resulting in a difference print which is matched with a database of fingerprint templates (page 1, paragraph [0010]). Bjorn merely discloses digitizing a fingerprint and subtracting a digitized background from this digitized fingerprint to produce a differential print (Figure 5, 530) which is compared to other fingerprints. Bjorn does not disclose or suggest "a second step of judging whether the input data are proper for authentication, said second step *performed using a spatial frequency analysis of an input image represented by the input data*" as recited in claims 1, 12 and 23. Consequently, the hypothetical combination of Nakajima and Bjorn does not disclose each and every feature recited in independent claims 1, 12 and 23.

It has been held by the courts that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. See, *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). As illustrated above, the hypothetical combination of Nakajima and Bjorn does not disclose or suggest each and every feature of the present invention as recited in independent claims 1, 12, and 23. Thus *prima facie* obviousness has not been established. Accordingly, claims 1, 12 and 23 are distinguishable over the art of record in the application. Claims 3 and 6 depend from claim 1, claims 14 and 17 depend from claim 12, and claims 25 and 28 depend from claim 23, each incorporating all of the features of its base claim. Thus the dependent claims are patentable over the art of record for at least the reasons that their base claims are patentable over the art of record. Claims 2, 5, 8, 9, 11, 13, 16, 19, 20, 22, 24, 27, 30, 31 and 33 are canceled. Accordingly, withdrawal of this rejection is requested.

Rejection of Claims Under 35 U.S.C. §103

Claims 4, 7, 10, 15, 18, 21, 26, 29, and 32 are rejected under 35 U.S.C. § 103(a) as

unpatentable over Nakajima in view of Bjorn as applied to claims 2, 5, and 8 further in view of Modl, U.S. Patent No. 6,782,120. This rejection should be withdrawn based on the comments and remarks herein.

As discussed above, Nakajima and Bjorn, taken singly or in combination, do not disclose or suggest each and every feature in independent claims 1, 12 and 23. Modl does not overcome this deficiency, and the Examiner does not state otherwise. Thus independent claims 1, 12 and 23 are patentably distinguishable from the art of record in the application. Claim 7 depends from claim 1, claim 18 depends from claim 12, and claim 29 depends from claim 23, each dependent claim incorporating all of the features of its base claim. Hence, the dependent claims are patentable over the art of record in the application for at least the reasons that their base claims are patentable over the art of record. Claims 4, 10, 15, 21, 26 and 32 are canceled. Accordingly, this rejection should be withdrawn.

Conclusion

For at least the reasons set forth in the foregoing discussion, Applicant believes that the Application is now allowable, and respectfully requests that the Examiner reconsider the rejection and allow the Application. Should the Examiner have any questions regarding this Amendment, or regarding the Application generally, the Examiner is invited to telephone the undersigned attorney.

Respectfully submitted,



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